Claims:

1. A motor vehicle infrared (IR) communication device, preferably for an electronic fee-charging system, comprising IR transmitting and receiving elements arranged in a housing and oriented according to a first direction, which first direction extends at least substantially in a vertical longitudinal plane of the motor vehicle when the communication device is in a state installed in a motor vehicle, and transmitting and receiving electronics, characterized in that further IR elements (13) oriented at least according to a second direction (14) are additionally arranged in the housing (4), this second direction (14) being oriented towards one side, relative to the first direction (10), or to the vertical longitudinal plane, respectively.

2. A communication device according to claim 1, characterized in that, as further IR elements (13) oriented in the second direction (14), only IR transmitting elements are provided, and in that for the IR receiving elements (9) oriented in the first direction

(10), a directional characteristic (11) which is sufficiently wide also for receiving in the lateral direction is provided.

3. A communication device according to claim 2, characterized in that the directional characteristic (11) of the IR receiving elements (9) oriented in the first direction has a half value angle of from ±50° to ±75°, preferably approximately ±60°.

4. A communication device according to any one of claims 1 to 3, characterized in that the IR elements (13) oriented in the second direction (14) partly comprise a first, narrower far field directional characteristic (21) and for at least one other part comprise a second, wider near field directional characteristic (22) overlapping the first directional characteristic.

5. A communication device according to claim 4, characterized in that the at least two overlapping directional characteristics (21, 22) overlap each other in

a pre-determined mixing ratio, e.g. of approximately 2:1, the mixing ratio being determined by the respective number of IR elements (13) and/or the pre-determined amount of the current flowing therethrough.

6. A communication device according to claim 4 or 5, characterized in that the narrower far field directional characteristic (21) has a half-value angle of approximately ±10°.

7. A communication device according to any one of claims 4 to 6, characterized in that the wider near field directional characteristic (22) has a half-value angle of approximately ±20°.

8. A communication device according to any one of claims 1 to 7, characterized in that the second direction (14) defines an azimuth angle with the vertical longitudinal plane of from 35° to 55°, preferably approximately 45°.

9. A communication device according to any one of claims

2 to 8, characterized in that a data discriminator (32') determining the type of received data is connected to the receiving electronics (37), to which different data processing circuits (49, 51) are connected to which the respective data are supplied in dependence on the data type determination.

10. A communication device according to any one of claims 1 to 9, characterized in that a memory (53) for pre-determined messages is associated to a data processing circuit (51) and in that data transmitted in the second direction (14), or received from the second direction (14), respectively, and supplied by the receiving electronics (37) to the data processing circuit (51) comprise address information for reading out the respective messages from the memory (53).

11. A communication device according to claim 10, characterized by an optic and/or acoustic reproduction unit (52) for the messages.

12. A communication device according to any one of claims 1 to 11, characterized in that a data process-

ing circuit (49) is associated to a fee charging unit (50) as well as connected to the transmission electronics (36.1) for returning data relating to fees charged in the second direction (14).